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A Revision of the New Zealand Nidulariales, or "Birds-nest Fungi."

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A Revision of the New Zealand Nidulariales, or "Birds-nest Fungi."

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Plates 3, 4.

All species belonging to this order are saprophytic, occurring on decaying wood, old sacking, or on the ground. They favour moist localities, and may commonly be found growing on humus on the forest-floor. The fructifications are quite small, seldom attaining a greater diameter than 10 mm.; they may be cup- or funnel-shaped, although frequently obconic forms occur.

The order is widely distributed, and some of the species have been found in nearly every country in the world; others, again, have a very limited distribution, occurring in but one or two localities.

The order comprises only one family, the Nidulariaceae, consisting of the four genera *Cyathus*, *Crucibulum*, *Nidula*, and *Nidularia*. The genus *Sphaerobolus*, at one time included in the Nidulariaceae, was by Ed. Fischer (1900, p. 346) placed in a separate family, the Sphaerobolaceae.

In structure the fructifications of all genera, *mutatis mutandis*, are essentially alike, a typical fructification consisting of a peridium containing numerous lenticular bodies, peridiola (also termed "sporangioles"), which in turn enclose the hymenium, consisting of basidia and paraphyses.

The peridium is typically campanulate, although obconic or infundibular forms occur. It consists of a single thick felt-like layer of closely woven hyphal filaments (in *Cyathus* it is composed of three layers). The apex is at first enclosed by a thin epiphragm (absent in *Nidularia*, the peridia of which are globose, and at maturity dehisce by the irregular rupture of the walls), which at maturity becomes ruptured and finally gelatinized. This membrane, in *Crucibulum*, is formed of the same tissue as the peridium, but in *Cyathus* is composed of the ungelatinized portion of the gleba, which at first is covered by the peridium; during development the peridial wall gradually becomes pulled away and the uppermost portion becomes exposed, appearing as a thin white membrane.

The peridiola are lenticular in shape, and in structure consist of an outer loosely woven covering of hyphae, the tunica (which in certain species of *Cyathus* may be very thin or wanting), enclosing a partly gelatinized layer, the cortex. This structure is closely compacted, the tissues forming a pseudoparenchyma which in mature specimens is hard and horny. Within the cortex is a loosely woven hyphal layer, the free surface of which constitutes the hymenium, and consists of basidia and paraphyses. These are arranged in an irregular palisade layer around a central cavity, which is usually filled with the spores. The basidia are tetrasporous, and the basidiospores are sessile, sterigmata being absent. During development the basidia and paraphyses become compressed, so that at maturity they appear as irregular angular tissues. The spores are binucleate, hyaline, and usually possess a thick epispore, enlosing granular contents. The peridium is at first filled with loosely woven hyphae; these later become gelatinized, when the peridiola lie embedded in a gelatinous matrix, the

gleba. When the epiphragm ruptures the gleba dries out, portion persisting as a delicate membrane lining the inner wall of the peridium. At maturity this membrane is quite smooth and shining, and is often mistaken for a layer of the wall of the peridium.

In *Cyathus* and *Crucibulum* the peridiola are attached to the inner wall of the peridium by fine thread-like filaments, termed "funiculi." In *Cyathus* the funiculus consists of a cord of interwoven hyphal filaments differentiated into three regions: (*a*) a solid cylinder whose distal end merges with the inner wall of the peridium, (*b*) a median constricted region, and (*c*) an upper hollow sheath connected basally with the constricted region and apically with the ventral surface of the peridiolum. Within this sheath is a delicate much-convoluted thread, attached by one end to the peridiolum, and by the other to the constricted portion. This thread, when moist, is capable of extension to a distance of several (5–8) centimetres.

In *Crucibulum* the funiculus is less complicated in structure, as the hollow sheath enclosing the convoluted thread early becomes gelatinized, and so at maturity the thread is embedded in the resultant mucilage.

Development (*Cyathus*).

From hyphae ramifying in the substratum, mycelial strands become differentiated; the terminal portions of these become enlarged, differentation of the basidiocarp commencing slightly below this region. In the region of the future inner wall of the peridium a zone of hyphae becomes gelatinized, the whole inner portion eventually forming the gleba, the external portion persisting as the wall of the peridium. Within this area, at the periphery, the peridiola become differentiated, each originating around a common centre toward which the ends of hyphal filaments converge, differentiation of peridiola occurring successively from the base of the developing peridium towards the apex. Then a layer of hyphae round each peridiolum becomes partly gelatinized and forms the pseudoparenchyma of the cortex.

The funiculus originates in somewhat parallel filaments extending from the innermost surface of the peridium to the peridiolum. Later appear actively growing hyphae which elongate rapidly and form a bundle of parallel filaments. Surrounding this certain hyphae gelatinize and form the outer sheath of the mature funiculus.

The peridium enlarges in size and becomes differentiated into three definite regions; differentiation occurs first at the base, new growth taking place in an apical peripheral zone, and as gelatinization occurs basally upwards the apical portion is the last to become gelatinized, and thus persists for some time as the epiphragm. Finally the peridium is drawn away from the apex and the epiphragm becomes exposed; this then ruptures and becomes gelatinized, the gleba becomes exposed, and as the moisture dries out the peridiola fall to the bottom of the peridium, remnants of the gelatinous gleba persisting as a thin lining on the inner surface of the peridium.

Thanks are due to Mr. C. G. Lloyd, Cincinnati, for the determination of two species; to Professor H. B. Kirk, Messrs. E. H. Atkinson, and R. Grimmett, Wellington, Miss H. K. Dalrymple, Dunedin, and Dr. K. M. Curtis, Nelson, for contributions of specimens; and to Messrs. E. Bruce Levy and W. D. Reid, of the Biological Laboratory, Wellington, for the photographs used in this paper.

NIDULARIACEAE.

Saprophytic plants, growing on decaying organic matter on the ground. Fructifications consisting of variously-shaped peridia, containing numerous indehiscent, compressed peridiola, in the interior of which are borne the hyaline, unicellular basidiospores.

Of the three genera which occur in New Zealand, *Cyathus* is represented by five species, *Crucibulum* by one, and *Nidula* by two.

KEY TO THE GENERA.

a. Peridiolum closed by a definite epiphragm.
1. Peridiola attached by funiculi to the wall of the peridium.
(*a.*) Peridium of three distinct layers; tunica thin or wanting .. .. 3. *Cyathus.*
(*b.*) Peridium of one layer; tunica thick .. .. 2. *Crucibulum.*
2. Peridiola unattached by funiculi but free within the peridium 1. *Nidula.*
b. Peridium dehiscing irregularly, epiphragm absent; peridium subglobose *Nidularia.*

I. NIDULA White.

White, *Bull. Torr. Cl.*, vol. 29, p. 271, 1902.

Peridium cyathiform, composed of a single thick and felted layer formed of coarse dingy-coloured hyphae; mouth covered by an epiphragm similar in structure and origin to that of *Cyathus*. *Peridiola* embedded in the gelatinous (when moist) gleba which fills the interior of the peridium, not attached by funiculi; similar in structure to those of *Cyathus*. *Spores* hyaline, binucleate; epispore thick.

Distribution.—North America; India; Japan; Australia; Ceylon.

This genus is separated from the two following because of the absence of a funiculus, the peridiola being free and embedded in the gelatinous gleba; when the epiphragm becomes ruptured the gleba dries out and the peridiola become free within the peridium. The wall of the peridium is similar in structure to that of *Crucibulum*, save that the filaments of which it is composed are pallid-white and not coloured.

1. Nidula candida (Peck) White. (Plate 3, figs. 1, 2 *a*.)

White, *l.c.*, p. 271.

Nidularia candida Peck, *Reg. Rept.*, vol. 45, p. 24, 1891.

Peridia cyathiform, 6–15 mm. high, 6–15 mm. across the mouth, tapering slightly to the sessile truncate base, which is up to 8 mm. diam.; exterior white, becoming dingy with age, thick and felt-like, shaggy-tomentose, the tomentum aggregated into somewhat hispid tufts, interior smooth, shining, white or tinted yellow, darker below; mouth expanded but not recurved, entire, smooth, thick and firm. *Peridiola* reddish-brown, lenticular, 1·5–2 mm. diam., smooth; tunica thin, yellowish. *Spores* elliptical, 6–10 × 4–8 mmm.,* rounded at both ends.

Habitat.—Growing solitary on decaying wood and sticks on the ground.

Distribution.—Canada; Washington, North America: rare and local. Wallaceville, Wellington, *H. B. Kirk!* 24/7/21; Fringe Hill, Nelson, 500 m., *Miss K. M. Curtis!* 23/7/21.

The New Zealand form appears to be intermediate between this and the following species. For example, it has the solitary habit, large white

* In this article the contraction "mmm." is used for micromillimetres.

peridia covered with hispid tufts, and light-coloured peridiola of *N. candida*, and the smaller rugulose peridiola of *N. emodensis*. Then, too, the peridiola possess the peculiar stout, spiny, coloured fibrils so noticeable in the latter species, and the spores are roughly the same size; in shape, however, they are quite different. Nevertheless the peridal characters are so distinctive that I believe it should be retained under this species.

2. Nidula emodensis (Berk.) Lloyd. (Plate 3, figs. 2*b*, 3.)

Lloyd, *Nidulariaceae*, p. 12, 1906.

Cyathus emodensis Berk., *Hook. Jour. Bot.*, p. 204, 1854. *Crucibulum emodense* Berk., *Hdbk. N.Z. Fl.*, p. 621, 1867. *Nidula microcarpa* Peck; White in *Bull. Torr. Cl.*, vol. 29, p. 272, 1902. *Nidula microcarpa* var. *rugispora* White, *l.c.*

Peridia cyathiform, 4–6 mm. high, 4–5 mm. wide across the mouth, tapering slightly to the sessile truncate base, which is 3–5 mm. diam.; exterior dingy-grey, becoming darker with age, covered with closely appressed tomentum, wall much thinner than in the preceding species, interior smooth, shining, dingy-white, turning to pallid-brown in old specimens; mouth entire, slightly expanded, in old specimens slightly recurved, thin, smooth. *Peridiola* numerous, lenticular, reddish-brown, becoming almost black with age, 0·5–1 mm. diam., rugulose; tunica thick, fibrous, readily separable. *Spores* narrowly elliptical, or more commonly obovate or pyriform, apex rounded, base acuminate, 6–9 × 4–6 mmm.

Habitat.—Growing caespitose on decaying wood and sticks on the ground; rare.

Distribution.—California, Montana, North America; Sikkim, India; Japan; Australia; Cambridge, Auckland, *G. H. C.*, 17/1/20; Nelson, *D. Munro.*

I am indebted to Mr. C. G. Lloyd for the determination of this species. He states that it possesses the same coloured fibrils in the tunica (the only character that separated *N. emodensis* from *N. microcarpa* Peck), and is therefore *N. emodensis*. These fibrils are thick, rigid, and dark-coloured, and possess numerous short spiny branches. They are known to occur only in this and the preceding species.

The caespitose habit, smaller smooth peridia, darker peridiola, and differently shaped spores separate this species from the preceding.

II. Crucibulum Tulasne.

Tul., *Ann. Sci. Nat.*, ser. iii, vol. 1, p. 89, 1844.

Peridium cyathiform, composed of a single thick felt-like membrane of closely woven coloured hyphae; mouth when young covered by a well-defined epiphragm, formed from the undifferentiated peridial wall. *Peridiola* numerous, each consisting of an outer thick loosely woven tunica, a thick horny dark-coloured cortex, and a loosely woven hymenial layer; attached to the peridial wall by a funiculus, which is more simple in structure than that of *Cyathus*. *Spores* hyaline, binucleate, epispore thin.

Distribution.—World-wide.

The genus is represented by a single species. It is separated from *Cyathus* on account of the peridial wall consisting of a single layer, and because of the more simple funiculus, and from *Nidula* on account of the presence of funiculi.

1. **Crucibulum vulgare** Tulasne. (Plate 4, figs. 4, 7.)

Tul., *l.c.*, p. 90.

* *Cyathus Crucibulum* Pers., *Syn. Fung.*, p. 238, 1801. *C. laevis* DC., *Fl. Fr.*, vol. 2, p. 269, 1805. *C. fimentarius* DC., *ibid.*, vol. 5, p. 104, 1815. *Nidularia Crucibulum* Secret., *Mycogr. Suisse*, vol. 3, p. 378, 1833. *N. juglandicola* Schw., *Trans. Am. Phil. Soc.*, vol. 4, p. 253, 1834. *Cyathus fimicola* Berk., *Linn. Jour.*, vol. 18, p. 387, 1881. *C. pezizoides* Berk., *l.c.* *C. pusio* Berk., *l.c.* *Crucibulum juglandicolum* De Toni in *Sacc. Syll. Fung.*, vol. 7, p. 44, 1888. *C. simile* Mass., *Grev.*, vol. 19, p. 94, 1891. *C. crucibuliforme* (Scop.) White, *Bull. Torr. Cl.*, vol. 20, p. 269, 1902.

Peridia cyathiform, up to 12 mm. high, 10 mm. wide at the mouth, tapering slightly to sessile truncate base, which may attain a thickness of 8 mm., seated on a basal pad of closely woven hyphae; exterior bright cinnamon, becoming dingy with age, in young specimens closely covered with silky appressed tomentum, becoming almost smooth with age, interior pallid-cinnamon, smooth, shining; mouth erect, or slightly expanded, margin even, thick, smooth. *Peridiola* pallid-brown or dingy-white, lenticular, smooth, 1·25–2 mm. diam.; tunica thick, dingy-white, readily separable. *Spores* narrowly elliptical, rounded at both ends, 7–10 × 4–6 mmm.

Habitat.—Growing solitary or caespitose on decaying leaves, sticks, old sacking, manure, &c., on the ground.

Distribution.—World-wide; common. Lake Papaetonga, Levin, *Mrs. M. Cunningham!* 31/8/19; York Bay, Wellington, *E. H. Atkinson!* 20/6/22; Cass, Canterbury, *unknown collector!* June, 1919; Fringe Hill, Nelson, 500 m., *Miss K. M. Curtis!* 23/7/21; Dannevirke, *W. Colenso;* Bay of Islands, *J. D. Hooker.*

This species varies considerably in the size and shape of the peridia and peridiola: for example, in specimens from the Cass the peridia are barely 5 mm. in height, and the peridiola correspondingly small, being less than 1 mm. in diameter.

III. CYATHUS Haller.

Hall., *Stirp. Helvet.*, vol. 3, p. 127, 1768. Ex Pers., *Syn. Meth. Fung.*, p. 237, 1801.

Cyathia P. Br., *Civ. & Nat. Hist. Jamaica*, p. 78, 1756.

Peridium composed of three distinct layers, at first closed by a thin white epiphragm which covers the mouth, dehiscing by the irregular rupture of this membrane. *Peridiola* lenticular, dark-coloured, consisting of an external white tunica which may be very thin or absent, a hard horny cortex, and an inner hymenial layer; attached to the inner wall of the peridium by a complex funiculus. *Basidiospores* hyaline, variable in size and shape, binucleate.

Distribution.—World-wide.

About twenty-six species are now recognized; of these five occur in New Zealand, one being endemic. The genus differs from *Crucibulum* in having a distinctly three-layered peridial wall, consisting of a loosely woven outer layer, a compacted pseudoparenchyma of partly gelatinized hyphal filaments forming a central layer, and an inner layer of loosely woven partly gelatinized filaments. It differs from *Nidula* in having the peridiola attached by funiculi to the inner wall of the peridium.

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* For earlier synonymy see Tulasne (1844).

KEY TO SPECIES OF CYATHUS.

Peridia internally striate	1. *C. novae-zelandiae.*
Peridia internally smooth and even.	
Spores over 20 mmm. long	5. *C. stercoreus.*
Spores under 20 mmm. long.	
Peridiola 2–3·5 mm. diam	4. *C. Olla.*
Peridiola 2–2·5 mm. diam.	
Peridia cythiform; margins erect	2. *C. Colensoi.*
Peridia campanulate; margins flaring	3. *C. Hookeri.*

1. **Cyathus novae-zelandiae** Tulasne.

Tul., *Ann. Sci. Nat.*, ser. iii, vol. 1, p. 66, 1844.

Peridia infundibuliform, 12–14 mm. high, 5–7 mm. wide at the mouth, tapering gradually to the base where suddenly converging to a short stipe about 2 mm. long and 1 mm. thick; exterior dark brown, covered with appressed tomentum, interior longitudinally striate for about half the depth of the peridium, black, dull; mouth erect or slightly expanded, revolute, striate, margin entire, even. *Peridiola* lenticular, 2·3–3 mm. diam., black; tunica thin, white. *Spores* elliptical, somewhat pointed at both ends, 11–13 × 5–6 mmm.

Habitat.—Growing caespitose on rotting bark.

Distribution.—Banks Peninsula, Canterbury, N.Z.; rare.

Type specimens collected by Raoul.

This endemic species has been collected but once. It may readily be distinguished from any other species occurring in New Zealand by the presence of longitudinal striae on the upper portion of the peridium.

2. **Cyathus Colensoi** Berkeley. (Plate 4, fig. 2.)

Berk., *Fl. N.Z.*, vol. 2, p. 192, 1855.

Peridia campanulate, up to 7 mm. high, 6 mm. wide at the mouth, tapering abruptly to short and slender stipe which about 1 mm. diam.; exterior from pallid-grey to bay-brown, finely tomentose, even, interior lead-coloured, smooth, somewhat shining; mouth erect, in old specimens slightly recurved, margin entire, even. *Peridiola* lenticular, 2 mm. diam., black; tunica thin, white. *Spores* variable in shape and size, elliptical when 10–12 × 8–10 mmm., or subglobose when 9–12 mmm. diam.

Habitat.—Growing crowded or caespitose on dead wood on the ground.

Distribution.—Australia; Dannevirke, N.Z.: rare. *W. Colenso*, Dannevirke (type), on ground in a garden.

This species somewhat resembles *C. Olla*, but may be distinguished by the smaller differently shaped peridia, smaller peridiola, and more globose

PLATE 3.

FIG. 1.—*Nidula candida* (Peck) White. Natural size. Epiphragm is present on the central plant. Section on the left; note the thick wall of the peridium.

FIG. 2.—*a.* Peridiola of *Nidula candida*; × 10 diam. *b.* Peridiola of *Nidula emodensis* (Berk.) Lloyd; × 10 diam.

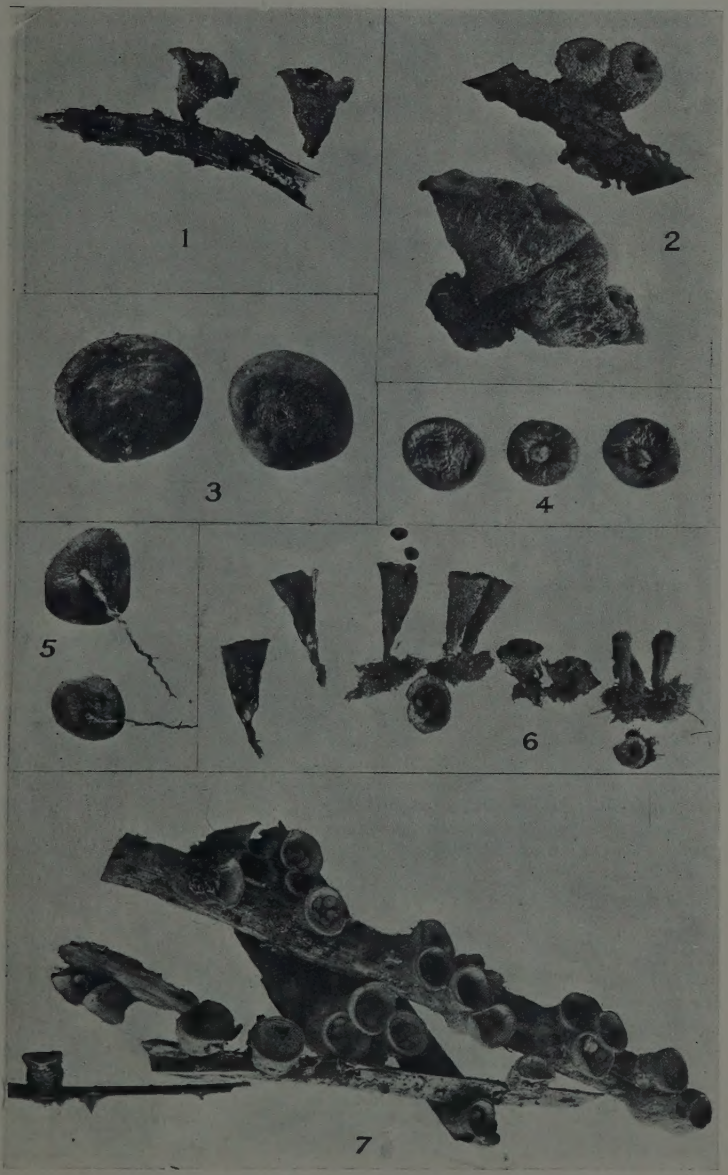
FIG. 3.—*Nidula emodensis* (Berk.) Lloyd. Natural size. Plants are growing on rotting log of *Podocarpus* sp. Note the caespitose habit.

FIG. 4.—Section of young peridium of *Cyathus Olla* Pers., × 2·5 diam., showing the peridiola embedded in the gleba.

FIG. 5.—Peridiola of *Cyathus Olla* Pers. × 10 diam. Point of attachment of the funiculus shown on the specimen on the right.

FIG. 6.—*Cyathus Olla* Pers. Natural size. Immature plants in the centre, section of a peridium on the right.

(Fig. 4 photographed by the writer; all others by E. Bruce Levy.)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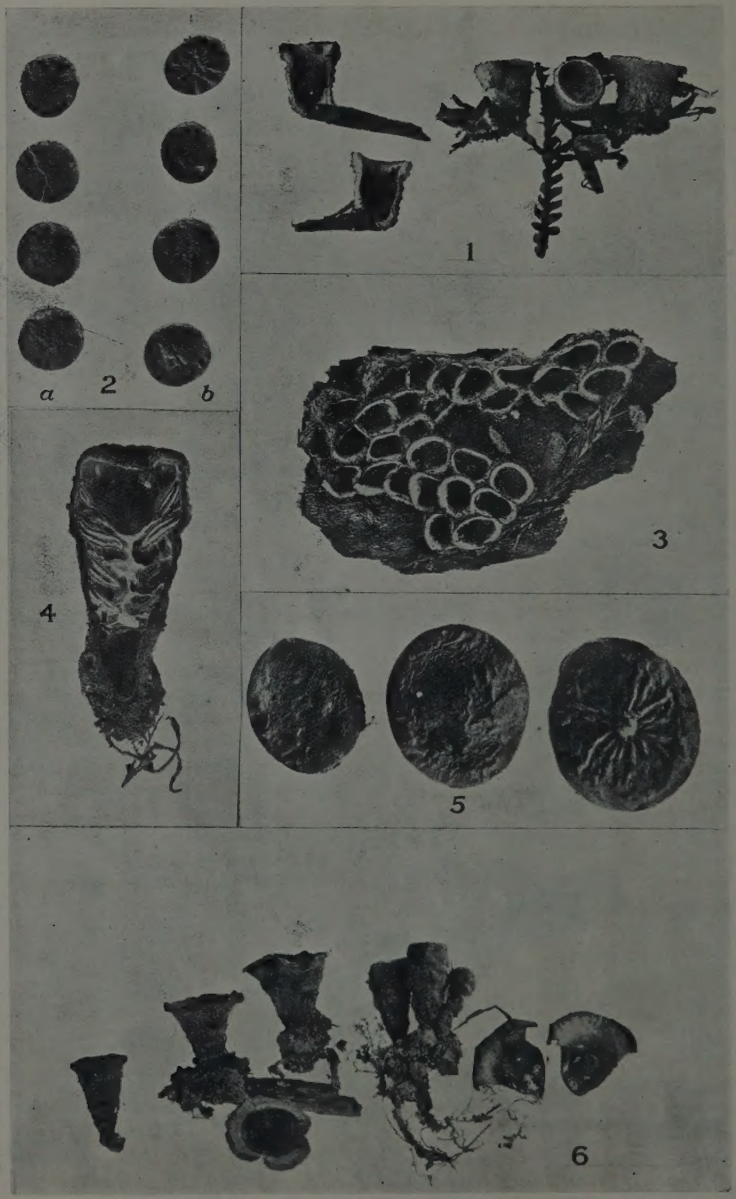

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spores. I am indebted to Dr. J. B. Cleland, Adelaide, for the loan of specimens of this species. The photograph given is taken from his specimens.

3. Cyathus Hookeri Berkeley. (Plate 4, figs. 1, 3.)

Berk. in Hook. *Jour. Bot.*, p. 204, 1854.

Peridia campanulate, up to 14 mm. high, 10 mm. wide at the mouth, narrowing abruptly into a short stipe 2–3 mm. long, 2 mm. thick; exterior bay-brown, minutely and densely tomentose, interior even, dark brown, dull; mouth strongly expanded or flaring, margin entire, crenately lobed. *Peridiola* lenticular, 2–2·5 mm. diam., cortex black; tunica dingy-white, thin. *Spores* elliptical, rounded at both ends, 8–11 × 6–8 mmm.

Habitat.—Growing solitary or caespitose on decaying twigs, &c., on the ground.

Distribution.—Khasa, India; North Island, N.Z.: rare. Weraroa, Wellington, on rotting twigs of *Pinus* sp., *G. H. C.*, 18/8/19.

I am indebted to Mr. C. G. Lloyd for the determination of this species. In a recent letter he stated that he did not consider it to be sufficiently distinct from *C. microsporus* Tul. to be maintained as a distinct species. I am of the opinion, however, that the large campanulate peridium and larger spores are sufficient to maintain it as a valid species.

4. Cyathus Olla Persoon. (Plate 3, figs. 4, 6.)

Pers., *Syn. Meth. Fung.*, p. 237, 1801.

Cyathus vernicosus DC., *Fl. Fr.*, vol. 2, p. 270, 1805. *Nidularia plumbea* Pers., *Champ. Comest.*, p. 110, 1818. *N. fascicularis* Schw., *Trans. Am. Phil. Soc.*, vol. 4, p. 253, 1834. *Cyathus campanulatus* Cda., *Anleit.*, lxxx, pp. 19–23, 1842. *C. similis* Cke., *Grev.*, vol. 8, p. 58, 1879. *Cyathia lentifera* (L.) White, *Bull. Torr. Cl.*, vol. 29, p. 264, 1902.

Peridia at first urceolate, becoming campanulate, up to 15 mm. high, 6–12 mm. wide at mouth, tapering strongly to the sessile truncate base; exterior grey-fawn, bleaching pallid-yellow with age, clothed with fine appressed tomentum, interior smooth or somewhat concentrically zoned, dull lead-colour, shining; mouth strongly expanded or flaring, not or slightly recurved, margin entire, crenate. *Peridiola* lenticular, dark brown or lead-coloured, large, 2–3·5 mm. diam., smooth, or minutely rugulose when dry; tunica thin, dingy-white, closely adnate. *Spores* obovate or elliptical. 8–15 × 6–10 mmm., apex rounded, base bluntly pointed.

PLATE 4.

FIG. 1.—*Cyathus Hookeri* Berk. Natural size.
FIG. 2.—*Cyathus Colensoi* Berk. × 2 diam. Immature plants at the top. Photos taken from Australian specimens loaned by Dr. J. B. Cleland.
FIG. 3.—Peridiola of *Cyathus Hookeri* Berk. × 10 diam. The depression in the surface of the specimen on the right shows point of attachment of the funiculus.
FIG. 4.—Peridiola of *Crucibulum vulgare* Tul. × 10 diam.
FIG. 5.—Peridiola of *Cyathus stercoreus* (Schw.) de Toni. × 10 diam. Note the extended funiculi.
FIG. 6.—*Cyathus stercoreus* (Schw.) de Toni. Natural size. Immature specimens on the right; small form in the centre.
FIG. 7.—*Crucibulum vulgare* Tul. Natural size. The epighragm is present on several of these specimens.

(Fig. 2 photographed by the writer; all others by E. Bruce Levy.)

Habitat.—Growing solitary or caespitose on rotting twigs, dead grass-stems, or on the ground.

Distribution.—World-wide; common. Pukeora, Hawke's Bay, *H. E. Radcliffe!* 17/10/21; Wellington, *R. Grimmett!* April, 1922; Dunedin, *Miss H. K. Dalrymple!* 5/5/22; Kelburn, Wellington, *G. H. C.*, April, May, 1922.

The large, smooth, campanulate peridia and large peridiola characterize this species. The peridia are often concentrically zoned, and vary greatly in size. This is our most common species of *Cyathus*.

5. **Cyathus stercoreus** (Schw.) De Toni. (Plate 4, figs. 5, 6.)

De Toni in *Sacc. Syll. Fung.*, vol. 7, p. 40, 1888.

Nidularia stercorea Schw., *Trans. Am. Phil. Soc.*, vol. 4, p. 253, 1834. *N. melanosperma* Schw., *l.c.* *Cyathus Lesueurii* Tul., *Ann. Sci. Nat.*, ser. iii, vol. 1, p. 79, 1844. *C. Wrightii* Berk., *Grev.*, vol. 2, p. 34, 1873. *C. melanospermus* De Toni in *Sacc. Syll. Fung.*, vol. 7, p. 42, 1888. *C. Baileyi* Mass., *Grev.*, vol. 21, p. 3, 1892. *C. dimorphus* Cobb, *Agr. Gaz. N.S.W.*, p. 1005, 1892. *C. affinis* Pat., *Bull. Soc. Myc. Fr.*, p. 87, 1895. *C. rufipes* Ell. et Ev., *Bull. Torr. Cl.*, vol. 24, p. 125, 1897. *Cyathia melanosperma* (Schw.) White, *ibid.*, vol. 29, p. 262, 1902. *C. rufipes* (Ell. et Ev.) White, *l.c.*, p. 265. *C. Wrightii* (Berk.) White, *l.c.* *C. stercorea* (Schw.) White, *l.c.*, p. 266.

Peridia at first ureceolate, becoming obconic or campanulate, 5–15 mm. high, 4–8 mm. across the mouth, tapering gradually to the slender and short stipe, or sessile; exterior fawn-coloured, at first hirsute, becoming almost smooth with age, interior smooth, lead-coloured, shining; mouth erect, not or slightly expanded, margin entire, even. *Peridiola* lenticular, 2 mm. diam., smooth and shining, black; tunica wanting. *Spores* subglobose, 20–40 mmm. diam.; epispore 3 mmm. thick.

Habitat.—Growing solitary or caespitose on manure, decaying wood, soil, and boxes in glasshouses, &c.

Distribution.—World-wide; common. Mapua, Nelson, on cow-dung, *G. H. C.*, 17/5/22.

This species varies considerably in the size and shape of the peridia. It may readily be separated from other species of this genus on account of the large-sized spores, black peridiola, and narrow obconic peridia. Lloyd (1906, p. 20) states that peridia are occasionally found in which the upper peridiola are not attached to the wall by funiculi, this latter structure apparently being rudimentary or absent. He also mentions the fact that with this species sterile peridiola commonly occur, a feature apparently not uncommon in the large-spored species.

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